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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,912	03/22/2001	Perry Robert Czimmek	051252-5116	4677

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EXAMINER
JONES, JUDSON

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 05/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/813,912	CZIMMEK, PERRY ROBERT
	Examiner	Art Unit
	Judson H Jones	2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/23/2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-14 and 18* is/are allowed.

6)☒ Claim(s) *1-6,8 and 9* is/are rejected.

7)☒ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *23 December 2002* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _ ___ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Drawings

The proposed drawing corrections have been approved. As Applicant requested in regard to claim 13, the requirement for a drawing illustrating the subtraction of voltage across a coil and other features of this claim is withdrawn.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Hasselmark et al. 4,585,978 A (of record). Hasselmark et al. discloses a method of controlling a magnetostrictive actuator comprising energizing a coil of an actuator, measuring the amount of flux generated in the coil and using the measured flux as a feedback variable to control the amount of magnetizing force applied to a magnetostrictive member located within the coil as described in column 2 lines 42-65.

In regard to claim 2, see Hasselmark et al. column 3 lines 18-21.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hasselmark et al. in view of Kazama et al. 6,181,036 A. Hasselmark et al. discloses the method of controlling a magnetostrictive actuator by measuring the magnetic flux but does not disclose sensing the flux with a Giant Magnetoresistive (GMR) sensor. However Kazama et al. teaches using a GMR

sensor in place of a Hall effect element in column 1 line 42 to column 2 line 25 for the purpose of reducing the size of the motor. Since Kazama et al. and Hasselmark et al. are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a GMR sensor in the device of Hasselmark et al. in order to reduce the size of the motor and thus allow the motor to be used in situations where space is restricted.

Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasselmark in view of Mandl et al. 6,288,536 B1. Hasselmark discloses the method of controlling a magnetostrictive actuator by measuring the magnetic flux but does not disclose using an eddy current sensor to measure the flux. Mandl et al. teaches in the abstract that an eddy current sensor can easily compensate for temperature influences. Since Mandl et al. and Hasselmark are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized an eddy current sensor for flux sensing in situations where temperature variations were a problem.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasselmark et al. in view of Seale et al. 6,208,497 B1. Hasselmark et al. discloses the method of controlling a magnetostrictive actuator by measuring the magnetic flux but does not disclose integrating a time derivative of magnetic flux. Seale et al. teaches a very precise method of controlling an actuator in order to control the seating of the actuator and to prevent bounce by controlling the voltage and current supplied to the actuator. In column 29 line 50 to column 30 line 13 Seale et al. teaches the relationship between current, voltage and flux and further teaches integrating a time derivative of magnetic flux in column 30 lines 2-9. Since Seale et al. and

Hasselmark et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized the precision control means including integrating a magnetic flux time derivative of Seale et al. in an actuator in order to control bounce when an actuator is seated and thus improve the performance of the actuator.

In regard to claim 6, see Seale et al. column 30 lines 2-5.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasselmark et al. as applied to claim 1 above, and further in view of Japanese reference 4-4776 (of record). Hasselmark et al. discloses the method of controlling a magnetostrictive actuator but does not disclose correcting varying the amount of flux applied depending on the temperature of the actuator. However the Japanese reference teaches detecting the temperature of a field generating coil for a magnetostrictive element and correcting for thermal variations in the English translation of the abstract.

In regard to claim 9, see Hasselmark et al. column 5 lines 10-26 which teaches a position command signal (i.e., a first setpoint level) and a correction signal both being fed to a summing junction that produces a modified position command signal (i.e., a second setpoint level). Figure 1 of the Japanese reference shows a signal from a temperature sensitive element going to box 51, to box 52, to box 31 and finally to box 32. Another input for box 32 comes from box 33, which supplies a first setpoint level. After being modified by the thermal correction factor, a second setpoint level is used to supply power to the coil. (A translation of the Japanese reference is provided.)

Allowable Subject Matter

Claims 10-14 and 18 are allowable over the prior art of record.

Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose or teach measuring a voltage across an inactive one of two drive coils to determine the time derivative of the magnetic flux as recited in claim 7. The prior art of record does not disclose or teach basing a thermal correction factor on the resistance of the drive coil for use with a method of controlling a magnetostrictive actuator as recited in claim 10. The Japanese reference teaches basing the thermal correction factor on the resistance of a thermistor. The prior art of record does not disclose or teach a method of controlling a magnetostrictive actuator comprising measuring a flux set point at a predetermined current level, detecting the amount of change in the magnetic flux as compared to the flux set point and applying the amount of change in the flux as a feedback variable to control the magnetizing force as recited in claim 18.

Applicant's arguments filed 12/23/2003 have been fully considered but they are not all persuasive. Applicant argues the Hasselmark et al. relies on sensing magnetic flux density from a magnetostrictive rod rather than the magnetic flux produced by a coil. However the magnetic flux produced by the coil is the same flux that is present in the rod. Hasselmark et al. uses a Hall Effect electromagnetic transducer as described in column 3 lines 18-22 to detect what he calls "flux density" while applicant uses a Hall-effect sensor to detect what he calls "flux." While the words used are slightly different, both sensors are detecting the same the thing which is the flux produced by the coil and which is present in the magnetostrictive rod. The rejections based on

the Wright reference have been rewritten using different prior art. In regard to claim 8, the claim language does not read "correcting for thermal variations based on the amount of measured flux" as argued by applicant. The limitation of measuring the amount of flux appears in claim 1 where there is no mention of thermal variations. Claim 8 recites that the applying the amount of magnetic flux comprises correcting for thermal variations. The Japanese reference comprises correcting for thermal variations by detecting a temperature and then increasing or decreasing the power source voltage. The increased or decreased power source voltage would then change the flux produced by the coil.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Judson H Jones whose telephone number is 703-308-0115. The examiner can normally be reached on 8-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 703-308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3431 for regular communications and 703-305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JHJ
May 8, 2003